dent and teacher: Use this cover sheet for mailing or faxing.

ASSIGNMENT BOOKLET

9110 Mathematics 9
Module 4

FOR STUDENT USE ONLY	
Date Module Submitted: _____ Time Spent on Module: _____	(If label is missing or incorrect) File Number: _____ Module Number: _____

FOR TEACHER USE ONLY

Assigned Teacher: _____

Module Grading: _____

Graded by: _____

Date Module Received:

_____

Module Assignment Recorded: _____

Student's Questions and Comments

Apply Module Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and module.

Teacher's Comments

_____
Teacher

These instructions are for students registered with the Alberta Distance Learning Centre.

INSTRUCTIONS FOR SUBMITTING THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you are registered for distance learning courses, you are expected to submit Assignment Booklets for correction regularly. Try to submit each Assignment Booklet as soon as you have completed it. Do not submit more than one Assignment Booklet in one subject at the same time. Before submitting your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

MAILING

1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach sufficient postage and seal the envelope. Assignment Booklets will travel faster if sufficient postage is used and if they are in large envelopes that do not exceed two centimetres in thickness.

FAXING

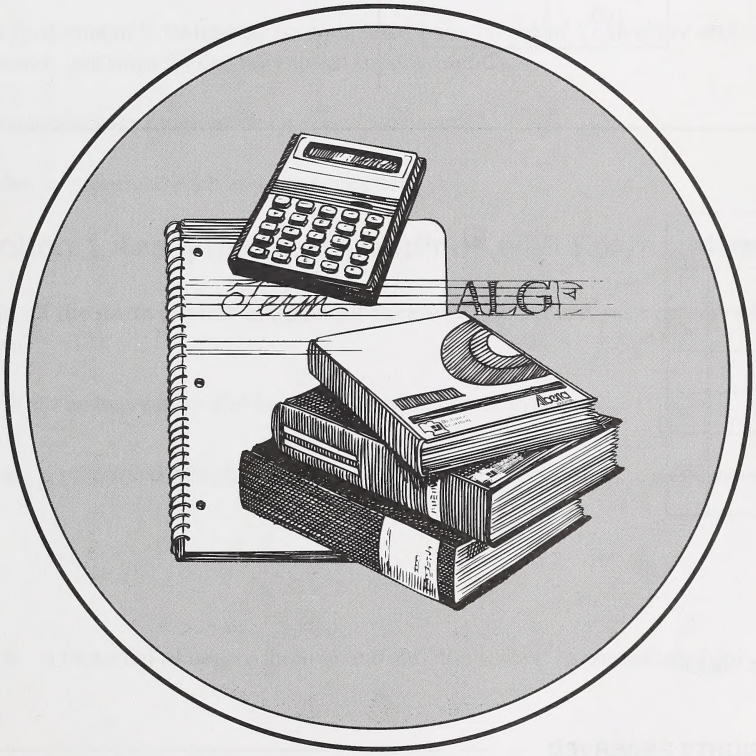
1. Assignment Booklets may be faxed to the Alberta Distance Learning Centre. Contact your teacher for the appropriate fax number.

2. All faxing costs are the responsibility of the sender.

E-MAILING

Assignment Booklets may be e-mailed to the Alberta Distance Learning Centre. Contact your teacher for the appropriate e-mail address.

MATHEMATICS 9
MODULE 4



Polynomials

ASSIGNMENT BOOKLET

Distance Learning

Alberta EDUCATION

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 1 Assignment	45	
Section 2 Assignment	20	
Final Module Assignment	35	
	100	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
General Public	
Other	

Mathematics 9
Assignment Booklet
Module 4
Polynomials
Learning Technologies Branch
ISBN 0-7741-1154-2

ASSIGNMENT BOOKLET
MATHEMATICS 9 – MODULE 4: POLYNOMIALS

Your mark on this module will be determined by how well you do your assignments in this booklet.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate section.

There are two section assignments and one final module assignment in this Assignment Booklet. The total value of these assignments is 100 marks. The value of each assignment is stated in the left margin.

This Assignment Booklet may be completed with the use of a calculator and resource materials. However, you must do the assignment **independently**.

You may do your rough work on your own paper.

Be sure to proofread each assignment carefully.

Section 1 Assignment: Operations with Polynomials

45

Read all the parts of your assignment carefully and record your answers in the appropriate place.

1. Write an expression that has the following characteristics.

(1/2) **a.** a monomial with a numerical coefficient of 3 and a literal coefficient of $x^2 y$

(1/2) **b.** a trinomial of degree three in one variable written in ascending order

(1/2) **c.** a binomial of degree 3 in two variables with a constant in descending order

(1/2) **d.** a fourth-degree monomial with a negative numerical coefficient and three variables

2. Write the expression represented by each group of tiles. **Note:** The dark tiles are positive, and the white tiles are negative.

(1) **a.**

(1) **b.**

3. Simplify each expression; then evaluate if $a = 2$, $b = -1$, and $c = 3$.

(2) **a.** $2c^2 + 7 - 3b + c^2 + b$

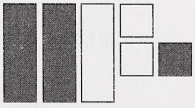
(2) **b.** $a^2b - b^2 + 3c - b^2 + c - a^2b + 1$

(1) **4.** Model $2m^2 - 4m + 5$ using algebra tiles.

5. State the algebra tiles you must add in order to make each diagram equal to zero.

(1) **a.**

(1) **b.**



6. Simplify the following polynomials.

(1) **a.** $(2x^2+7x+6)+(3x^2-5x+1)$

(1) **b.** $(4y^2-7y+5)+(5y-3)$

(1) **c.**
$$\begin{array}{r} 3x^2y+5xy-2y^2+8 \\ +\left(-2x^2y-\ xy+5y^2+1\right) \\ \hline \end{array}$$

(1) **d.** $(3x^3+4x^2-8)+(2x^2-5x+1)$

7. Subtract the following polynomials.

(1) **a.** $\left(3x^2 - x + 4\right) - \left(2x^2 + 4x - 3\right)$

(1) **b.** $\left(-4y^2 + 4y - 3\right) - \left(2y^2 + 8\right)$

(1) **c.**
$$\begin{array}{r} 2a^2b + 7ab - 4b + 3 \\ -\left(\ a^2b - 2ab + 5b - 8\right) \\ \hline \end{array}$$

(1) **d.** $(4ab - b + 8) - (4ab + b - 8)$

(8) **8.** Multiply the following. Collect like terms where possible.

a. $2m^2 \times 3m$

b. $\left(4ab^2c\right)\left(-3abc^3\right)$

c. $-2y\left(y^2-2y+3\right)$

d. $(4y)(-3xy)\left(2x^2y\right)$

e. $(x+5)(x+3)$

f. $(2x+3)(x-1)$

g. $3(x+4)+2\left(x^2-6x-3\right)$

h. $(x-8)(x+8)$

(3) **9.** Divide the following:

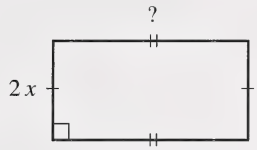
a. $\dfrac{10x^2+15x}{5x}$

b. $\left(18x^4+6x^3-9x^2+12x\right)\div 3x$

c. $\dfrac{24m^3-16m^2+32m}{8m}$

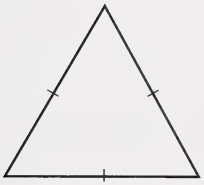
10. Find the missing dimension in each figure.

(1) **a.**



$A = 8x^2 - 12x$

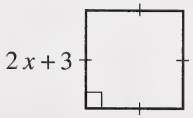
(1) **b.**



$P = 6x - 9$

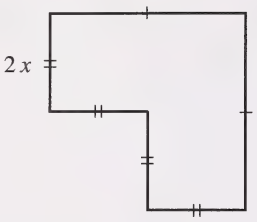
11. Find the area of each figure.

(1) **a.**



(1)

b.



12. Jason used algebra tiles and an area model to explain the multiplication of $3x(4y)$ to a fellow student. He set up his model in the following way.

(1)

a. Use the previous model to show how he filled the area of the rectangle to get the product.

(1)

b. Why did Jason choose a new shape to represent y?

_____

_____

(1)

c. How does the model justify the algebraic process for multiplying $3x$ by $4y$?

_____

_____

_____

13. The width of a rectangle is $3a$ and its area is $9a^2 + 6a$. Write an expression for the following and simplify.

(1) **a.** the length

(1) **b.** the perimeter

(1) **14. a.** Divide $8x^2y + 4xy^2 - 12x^2y^2$ by $4xy$.

(2) **b.** Illustrate two ways in which you can check to see if your answer is correct.

(3)

15. Kin is having difficulty with subtracting polynomials. His friend Marla is helping him by demonstrating the process using algebra tiles. The problem Marla is modelling is $\left(2x^2-4x+3\right)-\left(3x^2-2x-2\right)$. This problem is modelled with the following algebra tiles.

$\left(2x^2-4x+3\right)$ – $\left(3x^2-2x-2\right)$

Show how Marla would model the process and write out the instructions of how to use the algebra tiles to obtain this result. Write the algebraic equivalent below each model.

(20)

Section 2 Assignment: Factoring

Read all the parts of your assignment carefully and record your answers in the appropriate place.

(2) **1.** What does it mean when you are asked to factor $6x^2 + 12x$ completely? Explain.

_____

_____

_____

2. Find the greatest common factor of each group of terms.

(1) **a.** $4x^2y^4,\ -12x^3y^5,\ 6x^3y$

(1) **b.** $15ab^2c^4,\ 10a^2b^3c^2,\ 20a^4b^2c$

(1) **c.** $6x^2y^3z,\ 12x^4yz^2,\ 24x^3y^2$

3. Find the missing factor.

(1) **a.** $20a^2b^2 + 15ab^3 - 10a^2b^3 = 5ab^2$ ( )

(1)

b. $12b^2 - 32b = \square\,(3b - 8)$

(3)

4. Monica used algebra tiles to explain to her friend how to factor $x^2 + 3x + 2$. Write out the steps she would have to use in her explanation.

(8)

5. Factor each polynomial completely.

a. $7x^2 + 14x - 21$

b. $10x^2y + 8xy^2 + 6xy$

c. $x(x+3)+5(x+3)$

d. $\left(3a^2+6a\right)+(5a+10)$

(2)

6. Write the following fractions in simplest form.

a. $\dfrac{12ab^2}{8a^2b}$

b. $\dfrac{12mn}{18m^2n^3}$

(35)

Final Module Assignment

Read all the parts of your assignment carefully and record your answers in the appropriate place.

1. How would you describe (or classify) each of the following polynomials?

(1)

a. $5x^2+2x-3$

_____

_____

(1)

b. $3ab+5a^2b^3$

_____

_____

2. Simplify each expression and evaluate if $m = -2$ and $n = 3$.

(2) **a.** $4mn - 6m + 2n^2 + 3m - 2$

(2) **b.** $18 - 2m^3 + m^2 + 2m - 12 + 5m$

(2) **3.** Helga evaluated $x^2 - 6x + 2$ and $2x^2 + 3x - 1$ for $x = 3$. She got a value of -7 and 26 respectively. If she subtracted $2x^2 + 3x - 1$ from $x^2 - 6x + 2$ and then substituted 3 for x in the resulting polynomial, what value should she get? Explain how she could get this value without subtracting the polynomials and substituting 3 for x.

_____

_____

_____

_____

_____

4. Perform the indicated operations for the following. Write the answers in simplest form.

(1) **a.** $\left(4n^2-2n-5\right)+\left(3n^2-3n+7\right)$

(1) **b.** $\left(7+2b-3b^2\right)-\left(b^2+2b+3\right)+\left(b^2-4\right)$

(1) **c.**
$$\begin{array}{r} 3y^2-7y+4 \\ -\left(\ y^2+2y\ \right) \\ \hline \end{array}$$

(1) **d.** $\left(7ab^2c\right)(2ac)$

(1) **e.** $3xy\left(x^2+y-2\right)$

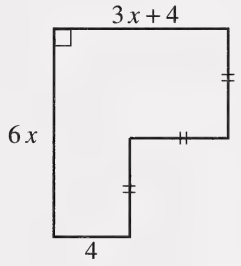
(1) **f.** $5(x+4)-3(x+2)$

(1) **g.** $\dfrac{4x^3y-6x^2y+8xy}{2xy}$

(1) **h.** $\left(4x^3y^2-8x^2y^3\right)\div 4x^2y^2$

(1) **i.** $(2x+3)(x-4)$

(3) **5.** Write an expression for the perimeter and area of this figure. Write your answers in simplest form.



(1)

6. Find the greatest common factor in the following set of factors.

$15a^2b^2c,\ -12a^2b^3c^2,\ 9ab^2c$

(5)

7. Factor the following completely.

a. $4m^3 - 8m^2 + 6m$

b. $6 + 18y + 36y^2$

c. $4a^2 + 12a + 8$

d. $x^2 - 5x + 6$

e. $8x^2y - 12x^3y^2$

8. Write a definition for each of the following. Provide an example as well.

(2) **a.** like terms

_____

_____

_____

(2) **b.** degree of a polynomial

_____

_____

_____

(1) **9.** Simplify $\frac{8a^2b^3c^4}{20ab^2c}$.

(1) **10.** If the expression $6x^2 + 15x$ represents the area of a rectangle and $3x$ represents the width, then find the length.

11. Elana wants to subtract the following two expressions.

$$\left(3x^2+2x-3\right)-\left(x^2-3x+2\right)=\_\_\_\_\_$$

She uses a related addition problem to find the difference.

(1) **a.** Draw the rearranged tiles for the related addition sentence.

(1) **b.** Draw the tiles that would make the related addition sentence true.

(1) **c.** Write the expression for the result of the subtraction problem.

ASSIGNMENT BOOKLET DECLARATIONS

The Student's Declaration is to be filled in by a student registered at the Alberta Distance Learning Centre. If the student is under 16, the Learning Facilitator's Declaration is to be filled in by the learning facilitator. Failure to complete this page may invalidate the assignment results.

STUDENT'S DECLARATION

- I have followed the instructions outlined in the Student Module Booklet.
- I have completed the activities to prepare myself for the assignments in this Assignment Booklet.
- I completed the assignments in this Assignment Booklet by myself.

_____

Student's Signature

LEARNING FACILITATOR'S DECLARATION

I hereby certify that I have supervised the learning activities completed by _____.

Student's Name

I also certify that to the best of my knowledge the assignments in this Assignment Booklet were completed independently by this student.

_____

Supervisor's Signature

If you, the student or learning facilitator, have any comments or observations regarding this module, write them in the following space.

Mathematics 9
Assignment Booklet
Module 4

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